

# Reducing stress in jail

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## Introduction

Close confinement, lack of choice and fear often create stress for inmates and staff in jails and prisons. Several studies have shown that correctional facility conditions, and particularly inmate overcrowding, can increase physiological stress, inmate illness and mortality (ZIMRING, 1981). We view stress as a consequence of the process of coping with perceived threat to important goals or well-being.<sup>1</sup>

In this paper we report on an evaluation of stress-reducing measures taken in an innovative California county jail<sup>2</sup> — the Contra Costa County Main Detention Facility (CCCMDF) — which has served as a model for many subsequent jails and prisons. We found that architectural design and operational strategies at CCCMDF have successfully reduced stress and violence without increasing cost or compromising security. More specifically, we briefly review the recent history of US correctional design and management and examine some of the evidence that prison and jail conditions cause stress. We then discuss the design and operations of CCCMDF and, finally, we present implications for future design, management and research.

## The US correctional system

The US has a single federal correctional system for adults and many independent systems at the state, county and local levels. In addition, most states and some local authorities have separate systems for youth. In this paper

we are discussing facilities for adults only.

The federal system, under the authority of the US Bureau of Prisons, houses inmates convicted of federal crimes such as drug offenses, embezzlement and kidnapping, and those felonies where state lines were crossed. Each of the 50 states has a separate prison system and is responsible for housing inmates who have committed "state" crimes such as murder, burglary, robbery and other offenses, usually with sentences over one year. Local authorities such as counties and cities run "jails" rather than "prisons" and house inmates awaiting trial and people convicted of lesser offenses such as "driving while intoxicated."

This division of responsibility between state, local and federal facilities has created significant differences in the nature of the inmates in the systems, in the design of the facilities and in the ways the facilities are managed. Because of the offenses that come under federal jurisdiction, inmates in federal facilities are often considered less violent than those in state facilities, although this may be changing with the recent increase in inmates with drug offenses housed in federal facilities. Inmates in local facilities are highly varied: whereas many may be briefly incarcerated for driving offences, others are awaiting trial for serious charges and will end up serving time in state or federal prisons if convicted. While inmates in state and federal facilities may have average sentences of several years, inmates in local facilities seldom spend more than a few months. Because most people incarcerated in local jails are awaiting trial rather than having been convicted of a crime, some designers and local authorities have invoked the American legal principle of "innocent until proven guilty" to justify providing less punitive facilities than might be provided at the state or federal level.

In general, jails are smaller than prisons. Also, because of the greater resources of federal authorities, and for political reasons, most innovations in design and management have originated in federal facilities. New models of design and management have typically been tried first in federal prisons, then adapted for state and local use.

## Jail and prison design: from indirect to direct supervision

The 200-year history of US prisons and jails represents several shifts in the key issues of correctional design and management:

- In the early 19th century, the first buildings developed especially as prisons were designed and built, most using the "panopticon" design coupled with the categorization and isolation of individual inmates;
- In the 1820s, a transition was made to surveillance of hallways and circulation areas rather than inmate living areas;
- Nearly 150 years later, in the 1960s, "remote podular" designs were provided, with cells clustered around common living space where recreation and other activities occurred;
- In the late 1970s and 1980s, the "direct supervision" model was developed, where officers were stationed in direct contact with inmates in housing units rather than in isolated control rooms, coupled with decentralized management responsibility.

The first buildings intentionally designed as prisons in the US employed a model called the "panopticon" proposed by Jeremy Bentham in the late 18th century (EVANS, 1984). Based on the design of a Russian textile mill, the panopticon was proposed to be a huge hollow building with individual cells around the outside and a guard tower in the center. The cells were to have large outside windows providing natural light and silhouetting prisoners so that the guards could see their activities at all times. The guard tower was to have louvers so that inmates could not see in, and had an entrance out of sight of inmates so inmates never knew if they were being watched. The original panopticon design was also to include many technical innovations such as mechanical air conditioning and indoor plumbing. The general plan of the panopticon is shown in figure 1.

The panopticon was based on separation of inmates from each other, the centralized grouping of officers in guard stations and remote anonymous surveillance. (This was bolstered by the invention of the "dossier," which provided remote anonymous information of a different kind). Although no "pure" panopticon designs were ever built, several attempts were made to reproduce it and the design remains influential in its emphasis on remote surveillance.

Later US prisons opened in the 1820s, such as the Philadelphia "Cherry Hill" Penitentiary and the Auburn Prison in New York State, maintained the emphasis on separation, classification and the power of surveillance introduced in the panopticon.<sup>3</sup> However, a different sort of radial plan was introduced. Officers in their stations could survey hallways and circulation areas rather than cells (fig. 2). This represented a shift from the panopticon, where officers could see inmates in their cells and could supervise every minute of daily life. The effect of this change was to cede control over living areas to informal inmate organizations and to focus officers' control on preventing escapes. In some cases, this informal organization was actually made explicit, such as in Texas where inmates were assigned as "building tenders."

Both the panopticon and later prisons were hard, dark, imposing facilities intended to be durable and escape-proof but also to symbolically assert the power of the State and the gravity of the inmates' crimes.

The basic design introduced in the 1820s became the prototype for most US and European prisons for nearly 150 years and was made famous in countless Hollywood films. It remained the standard until the 1960s, when

the "podular-remote" system became accepted. Rather than having cell blocks with up to five tiers of cells on a narrow corridor, the podular system grouped cells around a common day hall where inmates would congregate. The day hall was used for eating and recreation (fig. 3). Because of the large groups involved, and the resulting

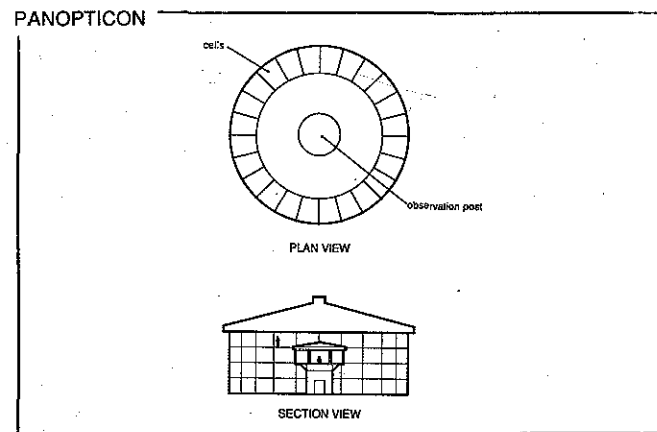


Fig. 1: The Panopticon design, developed by the British utilitarian philosopher Jeremy Bentham in the late 18th century.

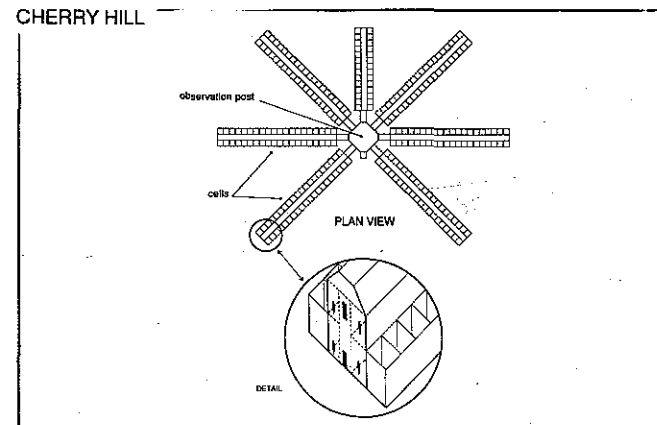


Fig. 2: Schematic plan of the Philadelphia "Cherry Hill" Penitentiary built in the 1820s.

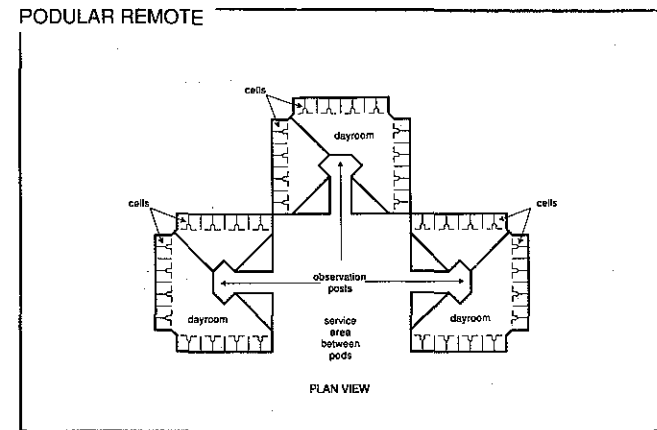


Fig. 3: The "podular remote" system returned surveillance of inmate living areas and reduced the need for inmates to travel to dining or recreation. The separation between officers and inmates was maintained.

difficulties in control, eating and recreation are the most dangerous situations in a correctional facility. So, the podular design was seen as an advance because it eliminated movement of inmates to dining and recreation, and reduced the sizes of groups participating in those activities. In addition, the podular system restored some of the features of the panopticon: officers in their stations could see into the cells and other living spaces of the inmates rather than limiting surveillance to the main circulation areas.

Until the 1970s all US correctional facilities used an "indirect supervision" model, where officers, who were typically armed, spent much of their time in work stations surrounded by bullet-proof glass or hardened screens. In the case of trouble, officers were to summon armed help from elsewhere in the facility. In most facilities, a few officers "walked the line" — the very dangerous duty of walking through the cell blocks and modules. These line officers would typically lock and unlock cells for inmates who had to go to work or to the visiting areas. Some facilities had centralized mechanical or electronic locks.

"Direct supervision" was introduced in federal pre-trial detention facilities in the 1970s in New York, Chicago and San Francisco and has subsequently been used in about 40 other federal, state and local facilities. Direct supervision facilities put unarmed officers directly on locked housing units rather than in enclosed stations. Inmates often spend much of their day on the housing units, and some institutions include eating and recreation facilities on the housing unit. As a result one or two officers may spend an entire shift locked into a housing unit with 50 to 100 or more inmates. The intention is that direct supervision gives competent staff primary responsibility for security in face-to-face situations, rather than relying on remote technological devices, and gives staff a large amount of ongoing direct personal contact with inmates. As a result of this contact, and for their own safety, officers will (presumably) learn of and diffuse impending problems. Some institutions also provide training for officers in interpersonal communications. In addition, direct supervision aims at providing effective control by dividing inmates into small, manageable groups of 50 to 100 inmates. When they are incarcerated, inmates are immediately classified and oriented, and potentially troublesome inmates are segregated from the general population.

Designers of direct supervision facilities emphasize "perimeter security." In this concept, the officers have less need to control hallways and circulation because the perimeter is (hopefully) impenetrable. In addition, direct supervision facilities typically attempt to provide an easily maintainable and secure but stress-reducing physical facility that helps create expectations for appropriate behavior by inmates. Instead of using "correctional" finishes and furnishings, such as stainless steel commodes and steel doors for cells, a direct supervision facility may have typical institutional ceramic fixtures and wood doors. Direct supervision facilities often are colorfully painted and have carpeting and other sound-attenuating features. The design often attempts to reduce the sources of stress in a jail or prison. For instance, they reduce competition among inmates by providing an adequate number of pay telephones and televisions.

The Contra Costa County Main Detention Facility (CCCMDF) in Martinez, California, which opened in January 1981 as the first "direct supervision" county jail in the US, has had a significant impact on the corrections industry. Since its opening, CCCMDF has received visitors from 46 US states and 16 countries and has been the focus of considerable press coverage and attention by corrections officials. Most reactions have been positive and claims have been made that CCCMDF points the way to a new model of corrections that will be more secure with less vandalism and violence. Direct supervision has gained many supporters and has been strongly advocated by agencies such as the National Institute of Corrections.

However in the nine years since CCCMDF opened, several hundred jails and prisons have been built and only about 40 of these are direct supervision facilities, with perhaps 60 more under construction. Whereas corrections officials and staff familiar with operating direct supervision facilities often favor this model for new jails and prisons, many others feel that it is too "soft" or is not appropriate for the type of inmate in their own areas.

### **US prisons and jails are crowded and likely to get worse**

From 1980 to 1985, the last year for which statistics are available, the US prison population grew by more than 52 percent to more than 500,000 persons, with over 750 added each week (US DEPARTMENT OF JUSTICE, 1988). In addition, over 200,000 people are incarcerated in local jails (US DEPARTMENT OF JUSTICE, 1988). A recent report by the Eisenhower Foundation found that the total number of US people behind bars increased from roughly 325,000 to 650,000 during the decade of the 1980s (BRODER, 1990). At the same time, there has been an unprecedented recent building boom in prison and jail construction, increasing jail and prison cells by 29 percent from 1979 to 1984. However this has not kept up with population increases and jails and prisons continue to get more crowded.

The increase in prison and jail admissions is due to several factors:

- public pressures for "getting tough on crime" have led to new sentencing guidelines, producing longer sentences and less use of probation and alternatives to incarceration;
- population demographics have shifted, with a large proportion of the population in the high-crime young adult category;
- use of drugs, and particularly crack cocaine, has increased, along with a general increase in the crime rate (US DEPARTMENT OF JUSTICE, 1988).

The result of growing overcrowding is that the jail we discuss in the paper, and many other correctional facilities, have the constant pressure of serving more inmates than they were designed to accommodate.

### **Stress in prisons and jails**

A large number of studies have suggested that prison conditions, and particularly inmate overcrowding, can produce stress for inmates (for reviews, see FARBSTAIN and WENER, 1981; ZIMRING, 1982; RUBACK and INNES, 1988;

WRIGHT and GOODSTEIN, 1989). One large archival study of 12 prisons in the Texas prison system, for instance, showed that "presence of other residents, low space per person, double-bunking and lack of privacy" seem to lead to more frequent suicides, nonviolent and violent deaths, psychiatric commitments, inmate-on-inmate assaults, disciplinary infractions, self-mutilation, illness-complaints and high blood pressure (COX, PAULUS and McCAIN, 1984). Other studies have found that living in group situations such as dormitories, as opposed to living in single cells, is related to increases in physiological measures of stress such as palmar sweat, pulse rate and systolic and diastolic blood pressure (D'ATRI, 1975; D'ATRI et al., 1981). Several studies have also shown that crowded conditions result in inmates reporting that they feel stressed and in less control of their situations (see, for example, RUBACK and CARR, 1984).

The relative importance of **social density** (number of people per room) and **spatial density** (area per person) has been hotly debated. Several early studies showed that social density seemed to be more important in predicting stress (see, for example, Paulus, Cox, McCain and Chandler, 1975) and at least one study reduced perceived stress by constructing individual modules within a large day hall, even though group size and area per person were not reduced (COX, PAULUS and McCAIN, 1984). Other studies, however, have found that area per person is a more important predictor of stress (CARR, 1981).

In addition, some researchers have looked at global differences in the physical setting. For instance, Wener and Olson (1980) observed three new federal direct supervision detention facilities and conducted interviews and distributed questionnaires. These high-rise facilities were the first direct supervision facilities in the US and used "soft" materials and finishes such as carpeting and colorful painted walls. The researchers found low levels of stress, violence and vandalism. Both staff and inmates were satisfied with the facility, but, contrary to some critics who said that the facilities were "too nice," emphasized that the centers were still highly punitive because they restrict freedom. Another positive consequence was less reported stress by officers, potentially leading to less sick leave and a higher level of professionalism.

Recently, several authors have criticized the early stress research as ignoring key institutional factors and for being irrelevant to policy makers. For example, in a re-analysis of the Texas prison data, one study suggests that the cause of stress may have been the disruption in the prison system following a court case rather than crowding *per se* (EKLAND-OLSON, 1986). Because the courts banned the harsh measures traditionally used to keep order in the Texas system, officers lost their traditional means of keeping control as did the inmate organizations that officers relied on for day-to-day management. When inmate "building tenders" were relieved of their responsibility to keep order on the housing units, officers were reluctant to walk the side corridors in the prisons, and these areas were ceded to inmates.

In another analysis, Ruback and Innes (1988) compared national death rates of the US population to death rates for prisoners. They found that the prisoners' death rate was actually much lower than that of the same age group in the general population. The researchers attributed this to reduction in deaths due to automobiles and violence,

which are significant causes of death in young men. Ruback and Innes also criticized research on perceived control and perceived crowding as being of little concern to policy makers. In addition, they pointed out that increased crowding often brings administrative responses such as increased supervision by officers. These measures may be stressful in themselves, rather than stress being caused by impacts of space restrictions, *per se*. In addition, the most crowded facilities are often the oldest and house the most serious offenders, factors that are seldom considered.

In sum, although much research examining the impact of the physical setting on inmates and staff has shown effects of prison conditions on stress, much of it appears to have a simplistic, mechanistic orientation. Space per person or people per room are used as variables without considering management practices or other issues. This point becomes clearer in the following sections: in our evaluation of the Contra Costa County Main Detention Facility we found that the fit between facility conditions and management can be effective in reducing stress.

## An evaluation of the Contra Costa County Main Detention Facility

The Contra Costa County Main Detention Facility (CCCMDF) opened in January, 1981, at a cost of \$25.9 million, located on a 8½ acre (approx. 3½ ha) site adjacent to the County Civic Center in downtown Martinez, California, about 40 miles east of San Francisco.

### Description of the facility

The Main Detention Facility is a compact four-story concrete building encompassing 170,450 sq.ft (15,835 sq.m) devoted to detention and support functions. An attached 10,450 sq.ft (971 sq.m) courts complex includes two courtrooms and support facilities (fig. 4).

Cells are grouped into nine modules: medical, mental health/administrative separation, intake, female, and four general population male units. Modules contain 30 to 46 cells on two levels around a central two-story day room space. The modules are designed to limit inmate movement and provide most functions and amenities in the unit: several televisions, telephones, contact and non-contact visiting, weight machines, dining with access to coffee or juice throughout the day, and access to separate outdoor recreation yards for each unit. None of these functions require additional staff.

The design is based in part on experience in Federal Metropolitan Correctional Centers (MCC) in New York and Chicago and, like those facilities, reduces violence by diminishing irritants in the jail, such as high noise levels and competition for telephones or televisions. An evaluation of the MCCs conducted by Dr Richard Wener and Dr Richard Olson<sup>4</sup> was important in the later parts of the design process: the design represents a building on experience that the present evaluation continues. Because CCCMDF is consciously based on an evaluation of a previous new design (a "second generation" facility), it is often called a "third generation" jail.

Innovations in the design include providing visiting in the modules, with access so that visitors and attorneys do not need to be escorted to visiting areas (or have



do paperwork near the entry to the modules at stand-up desks that are not enclosed. They are not otherwise separated from inmates. Deputies do not have keys to the exit doors; entry to the modules is controlled by Central Control, who unlocks the doors based on verbal request over an intercom. The deputies have personal alarms and radios. The deputies are supported by a thorough and vigilant classification program that separates violent or suicidal inmates shortly after booking and sends them to a separate segregation or medical unit. Compared to other jails, there is a much higher level of educational, vocational, religious and recreational programs.

## Objectives of the evaluation

The jail has been widely discussed and used as a model for several other recent jails, yet has also been criticized as "too soft" or as a special case not applicable elsewhere.

The purpose of this study, therefore, was to examine the relationship between the physical facility and the operations and experience at Contra Costa County Main Detention Facility after the facility had been operating for eight years.

We were particularly interested in examining the validity of the original claims: that CCCMDF would be a less stressful and more pleasant facility that would be at least as safe and no more expensive than other "harder" facilities.

## Types of surveys and methods used

- **Multiple methods** were utilized in the evaluation process:
- Interviews with all administrative staff and mental health staff, as well as selected deputies, inmates, professional visitors, Martinez real estate agents, and employees of the Sheriff's Department and County Administrator's Office.
- Analysis of records of cost, incident, assault and other data supplied by the Contra Costa County Sheriff's Department, Contra Costa County Administrator's Office, National Institute of Justice, and other agencies.
- Observation of activities in several modules, including observation of ongoing activity and use of the setting and specific observation recording interactions between inmates and deputies in the modules. This observation scheme was developed by Wener and Farbstein as part of a study of direct and indirect supervision correctional facilities. We recorded who initiated the interaction, what its purpose was, where it occurred, what its quality was (friendly, businesslike or hostile) and how long each interaction lasted.
- Analysis of multiple choice questionnaires administered to inmates and deputies. These questionnaires were also developed by Farbstein and Wener as part of their study. One hundred and twenty questionnaires were randomly distributed to 30 inmates in each of three male general population modules and to 30 female inmates in the female module; the 103 questionnaires returned represent an 80 percent response rate. The 103 respondents represent about 20 percent of all inmates present in those units when the questionnaire was administered on December 1, 1988. All deputies working in those modules were given a questionnaire, and all returned them, which is a 100 percent response

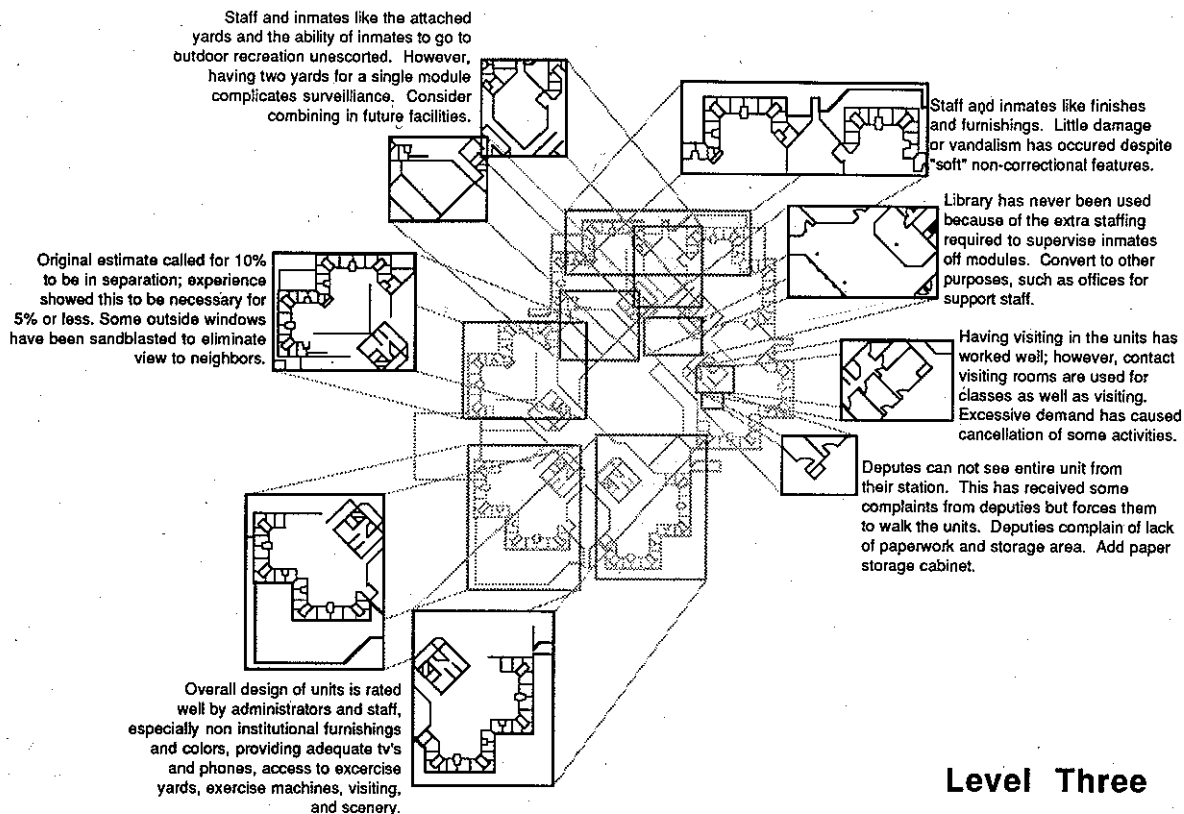
rate. The staff questionnaire included 81 multiple choice items; the inmate questionnaire had 93 items. Both questionnaires assessed respondents' perceptions of the same range of items:

- frequency, ease and quality of contacts between inmates and staff;
- frequency of violence and assault, staff response time;
- vandalism;
- satisfaction with facilities;
- perceived adequacy of space provided;
- crowding and privacy;
- lighting, sound, cleanliness;
- control over the environment;
- time spent on various activities;
- rating of own health based on the somatization scale of the Hopkins Symptom Checklist, a well-validated scale that asks health symptoms and which is often used to detect health effects of stress;
- sex, age, education, etc.
- **Analysis of newspaper and magazine articles** about Contra Costa County Main Detention Facility and about direct supervision jails. These articles helped clarify the origin and evolution of the direct supervision concepts and the popular and professional views of CCCMDF.
- **Site visits:** The evaluation team conducted general interviews and observations on August 10-11, 1988 and December 12-13, 1988. Interviews focused on maintenance practices and procedures and were conducted on November 1, 1988. Questionnaires were administered by Dr William Frazier, Director of Inmate Industries, on December 1, 1988. Additional data were collected by phone and mail from July 1, 1988 to October 30, 1989.
- **Comparison with two other modern jails and four modern prisons:** Through cooperation with the Farbstein/Wener study on direct and indirect supervision facilities we were able to compare costs and inmate and staff responses and behaviors to the following two other jails and four state prisons (table 1):

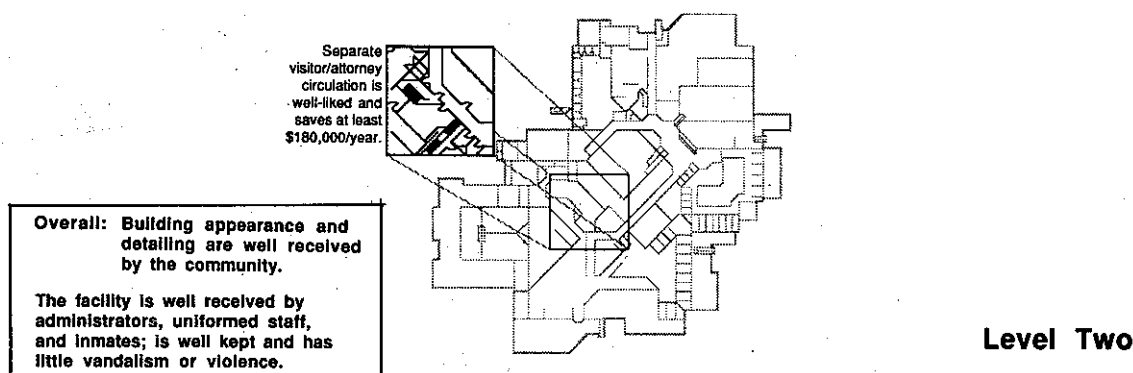
**Table 1**  
Comparison of CCCMDF data with two modern jails and four recent prisons

	CCCMDF	ROA	PIMA	CHIL	LCI	RSP	NSP
Type	Jail	Jail	Jail	Prison	Prison	Prison	Prison
Capacity	386	236	468	1360	696	471	1008
Census	850	245	~450	1360	1000	388	1008
In/Staff(day)	1:50-1:65	~1:22	1:29	1:38	1:27	1:23	1:23
Supervision	Direct	Indir	Direct	Direct	Direct	Mix	Mix
Opened	1981	1979	1984	1987	1985	1986	1986

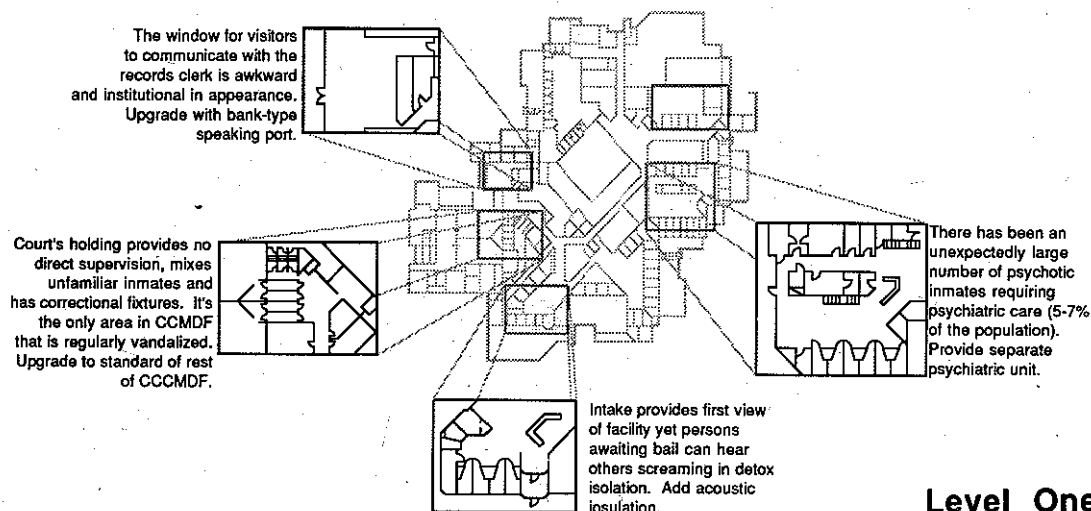
Note: CCCMDF = Contra Costa County Main Detention Facility  
 ROA = Roanoke City Jail  
 PIMA = Pima County Jail  
 CHIL = Ross Correctional Institution  
 LCI = Lieber Correctional Institution  
 RSP = Riverfront State Prison  
 NSP = Northern State Prison



### Level Three



### Level Two



### Level One

**Fig. 4b: The Contra Costa County Main Detention Facility — The evaluation yielded both specific and general results.**



- **Roanoke City Jail (ROA)** is an indirect supervision, locally operated jail in Virginia for pre-sentenced persons. Operational since 1979, ROA had an average daily population of 245 for the first six months of 1988 and a rated capacity of 236. For the day shift, 3 officers supervise 56 to 80 inmates in 8 pods. Officers communicate with inmates via intercom or through a glass door.
- **Pima County Jail (PIMA)** is a primarily direct supervision jail in Tucson, Arizona, opened in 1984. Daily population varies between 350 and 540 for a rated capacity of 468. The overall security staff to inmate ratio is 1:1.8 (294:540). The housing units have 36 single cells on two levels surrounding a central day room. Designed originally as an indirect supervision facility, there is a separate control room that operates unit doors and an open officer desk next to the entry. The day shift unit staffing is 1:28.8.
- **Ross Correctional Institution (CHIL)**, located in Chillicothe, Ohio and operational since March 1987, uses direct supervision and unit management. A 1,360-bed campus plan medium-security state prison, it operates at about 100 percent of its capacity, although the capacity was increased from 1,000 to 1,360 by adding bunks to about 40 percent of single cells. The total institution security staff-to-inmate ratio is 1:4.8. Housing units are two separate 170-bed buildings, each of which is divided into two 85-bed pods. The day shift unit staffing is approximately 1:38.
- **Lieber Correctional Institution (LCI)** is a 696-bed medium-security state prison in South Carolina, opened in 1985. A direct supervision facility with "wings" with 126 cells, 52 percent of which are double-bunked, LCI operates with about 1,000 inmates. Officers can see into the day rooms but not into the cells without patrolling the wings. The day shift housing unit staff-to-inmate ratio is 1:27.
- **Riverfront State Prison (RSP)**, a hybrid direct/indirect supervision facility, has single cells. A dense, campus-like medium-security prison in Camden, NJ, the 471-person prison operates with about 388 inmates. Day shift unit staffing is 1:23; the overall correctional staff-to-inmate ratio is 1:1.6 (244:388).
- **Northern State Prison (NSP)** is also a hybrid direct/indirect facility, and is physically nearly identical to RSP. However, NSP is nearly twice as large with two mirror-image facilities. It operates at 100 percent of its rated capacity of 1,008 inmates. Day shift staffing is 1:23; the overall institution correctional staff-to-inmate ratio is 1:2.9 (344:1008).

## Evaluation findings

Figure 4 provides an overview of the findings of the evaluation. These are discussed in more detail below.

- **Inmate Profiles:** Because Contra Costa County offers a wide range of alternatives to detention, inmates at CCCMDF were incarcerated for fairly serious offenses — inmates with less serious offenses were housed in other ways. Also, a fairly high proportion of inmates had serious drug, alcohol or psychiatric problems.
- **Gender:** The rule of thumb in California is that about 10 percent of jail inmates are female. At CCCMDF the ratio is often higher: on August 11, 1988, 16 percent of inmates were women (130 of 830).

- **Age:** Most inmates are between 19 and 40 years old (92 percent of the sample answering the survey were in this range).
- **Offense:** Contra Costa County is consistently in the lowest 10 percent of California counties for incarceration rate. (In 1986 the mean for all California counties was 20.4 persons incarcerated for each 10,000 citizens; Contra Costa County had 12.6 per 10,000). This low incarceration rate is reflected in the profile of inmate offenses that reflects many serious crimes: system-wide (including the lower security work camp) nearly 20 percent of males had violent felonies as their "most serious" offenses and this proportion is higher for the main detention facility. System-wide, on March 6, 1988, 67 percent of all inmates were in custody for felonies,

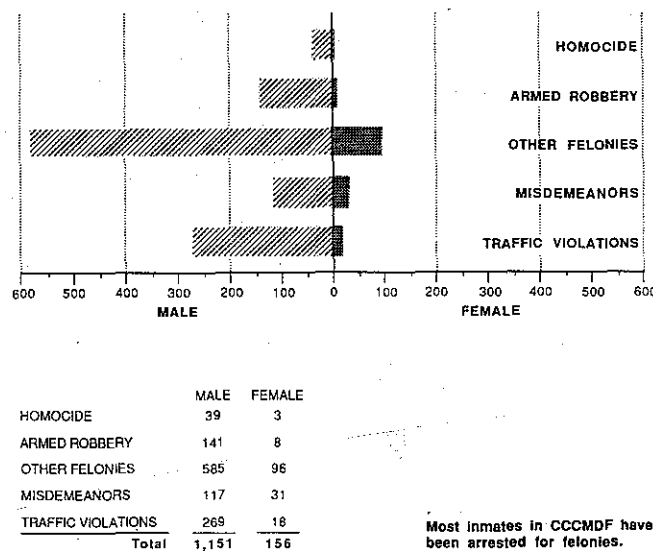


Fig. 5: Most inmates in CCCMDF have been arrested for felonies.

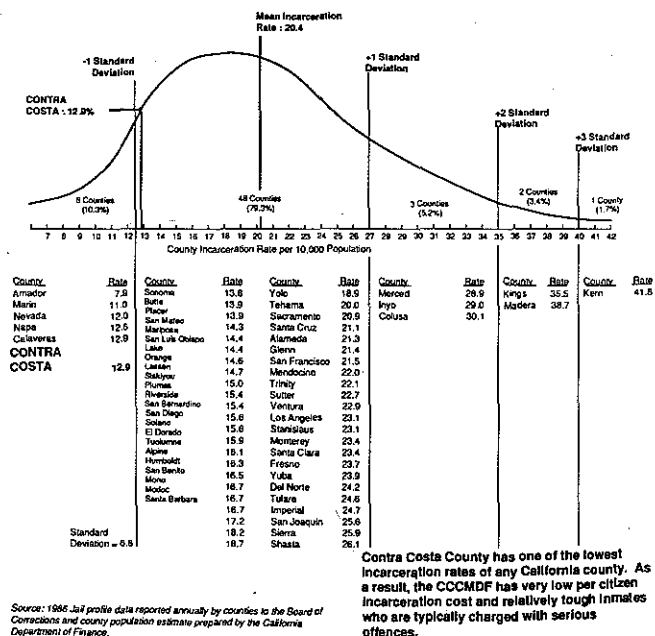


Fig. 6: Incarceration rate comparison for 1986.



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as compared to 11 percent for misdemeanors, and 22 percent for traffic offenses (mostly driving under the influence — D.U.I.).

- **Mental health status:** A much higher proportion of the inmate population requires mental health treatment than had originally been predicted. This may reflect more sophisticated diagnosis procedures, closing of mental institutions in California, inadequate study during the programming stage, or some combination of these. Based on their experience at CCCMDF, the mental health staff estimate that 25 to 30 percent of inmates have psychiatric problems and 5 to 7 percent require intensive inpatient treatment in a forensic psychiatric unit.

- **Stress among inmates:** In interviews the inmates typically said that CCCMDF was "the best jail they had ever been in." One female inmate said the "porcelain toilet made her feel feminine." Others said it was more like a rehabilitation program than a jail. In fact, several inmates mentioned that the facility was "too nice," and that it did not provide sufficient incentive to stay out (fig. 7).

The survey results were somewhat less positive. The inmates were about neutral on most aspects of the physical setting, and rated the jail similar to the other facilities on most characteristics. The greatest complaints were about the day room lighting for reading. There were many complaints about crowding-related problems: lack of room, lack of privacy, and noise (fig. 8).

- **Inmate response to CCCMDF:** The inmates find CCCMDF to be a generally safe and pleasant jail, with very few inmate assaults, fast officer response in case of trouble, and little vandalism. However, there seems to be some concern about assault by officers, and inmates have the perception that there is little conversation between inmates and officers. The inmates also complained of their ability to control poor cell ventilation, and lack of privacy and overcrowding.

Compared to other jails and prisons, CCCMDF inmates felt very safe from general attacks by other inmates and particularly safe from sexual assault. In nine years of operations, there have been no reported rapes at CCCMDF. The inmates were very satisfied with the staff response time in case of a fight or emergency. Vandalism is rated as very low. This fits the evaluation team's observations:

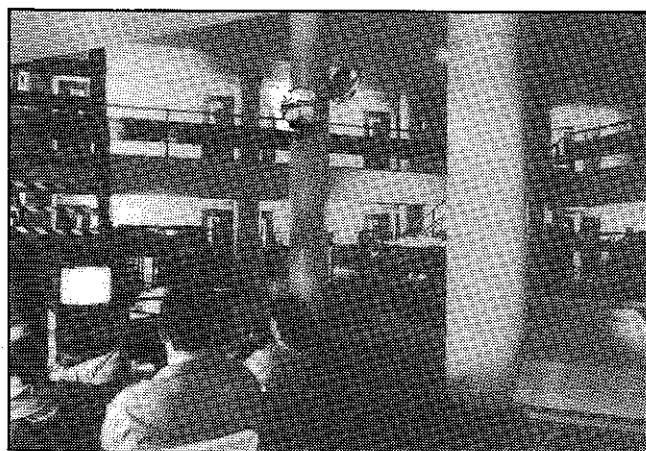


Fig. 7: CCCMDF — View of the interior that inmates rated highly and commented it was more like a rehabilitation program than a jail.

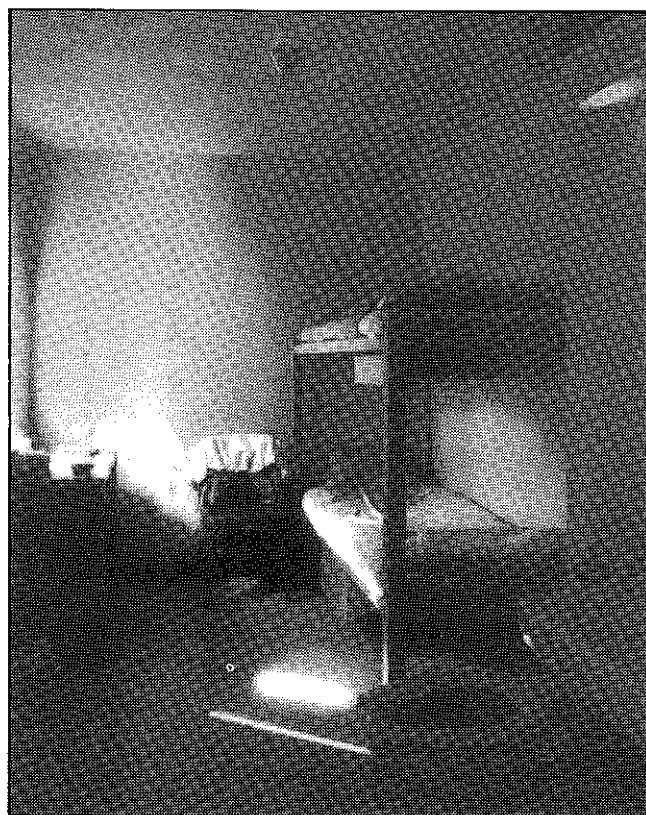


Fig. 8: CCCMDF — View of a single-occupancy intended cell where conditions were rated as comfortable, but where overcrowding became a significant source of stress.

Table 2  
CCCMDF — Inmate safety

Inmate Safety: Little Danger of Inmate Attacking Inmate							
	CCC	CHIL	LCI	NSP	PIMA	ROA	RSP
Agree	8.27%	11.29%	16.30%	23.19%	23.75%	24.66%	24.29%
	16.35	17.74	7.61	10.14	16.25	8.22	20.00
Neutral	41.35	29.03	22.83	25.09	27.50	31.51	21.43
	7.69	19.35	10.87	11.59	15.00	8.22	12.86
Disagree	15.38	22.58	40.22	27.54	17.50	26.03	15.71

Inmate Safety: Little Danger of Sexual Assault							
	CCC	CHIL	LCI	NSP	PIMA	ROA	RSP
Agree	59.62%	29.84%	33.70%	52.17%	51.25%	45.21%	44.29%
	13.46	24.19	21.74	7.25	16.25	16.44	17.14
Neutral	9.62	26.61	21.74	26.09	20.00	16.44	17.14
	3.85	9.68	8.70	2.90	3.75	6.85	8.57
Disagree	11.54	9.68	9.78	10.14	7.50	13.70	7.14

Inmate Safety: Frequency of Sexual Assault							
	CCC	CHIL	LCI	NSP	PIMA	ROA	RSP
Never	78.85%	59.68%	58.70%	65.22%	71.25%	60.27%	60.00%
	6.73	16.13	18.48	4.35	10.00	9.59	15.71
Neutral	4.81	14.52	8.70	14.49	8.75	12.33	10.00
	1.92	5.65	3.26	2.90	6.25	4.11	1.43
Often	0.96	1.61	6.52	4.35	3.75	5.48	4.29

CCCMDF inmates feel safe; compared to the other facilities studied, CCCMDF inmates reported there is little danger of attacks or sexual assault by other inmates.

Note: CCC = Contra Costa County Main Detention Facility  
CHIL = Ross Correctional Institution  
LCI = Lieber Correctional Institution  
NSP = Northern State Prison  
PIMA = Pima County Jail  
ROA = Roanoke City Jail  
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there was little visible graffiti or breakage (tables 2 and 3; figs. 9 and 10).

The jail has had little inmate-caused damage, especially considering the extra stress placed by overcrowding and that "soft" institutional furnishings and ceramic fixtures were used rather than security hardware. According to the maintenance staff, the following represents the entire list of vandalism over eight years (items broken): 14 porcelain sinks, 14 porcelain toilets, 1 hollow metal

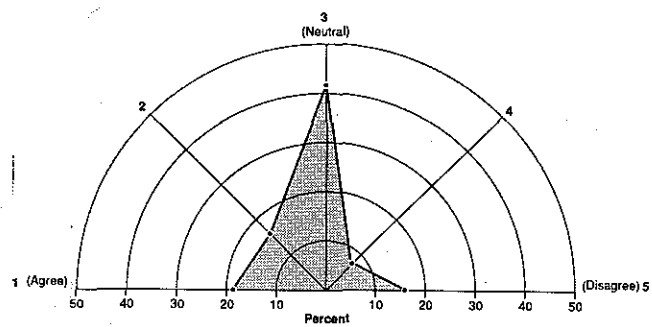
**Table 3**  
**CCCMDF — Staff response time**

Inmate Safety: Time to Respond to Emergency							
	CCC	CHIL	LCI	NSP	PIMA	ROA	RSP
< 30 sec.	16.35%	17.74%	20.65%	1.45%	21.25%	12.33%	8.57%
30-60 sec.	27.88	28.23	31.52	18.84	23.75	21.92	18.57
1-2 min.	22.12	20.97	15.22	17.39	15.00	10.96	17.14
2-3 min.	15.38	11.29	8.70	14.49	13.75	16.44	11.43
3-5 min.	4.81	7.26	8.70	23.19	8.75	19.18	12.86
> 5 min.	8.65	13.71	13.04	21.74	13.75	18.44	22.86

Inmate Safety: Adequate Response Time?							
	CCC	CHIL	LCI	NSP	PIMA	ROA	RSP
Yes	72.12%	54.84%	41.30%	57.97%	66.25%	20.55%	62.86%
No	20.19	43.55	54.35	40.58	31.25	73.97	30.00

More inmates at CCCMDF felt that staff response time was adequate than did inmates at any of the other institutions studied.

Note: CCC = Contra Costa County Main Detention Facility  
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Inmate Questionnaire Question 11				
Total $\bar{X}$	CCCMDF	PIMA	ROA	
3.1	2.9	2.9	3.0	

#### Legend

— CCCMDF  
--- PIMA  
... ROA

Compared to other jails, inmates at CCCMDF stated they had less concern about being attacked by other inmates.

Note: CCCMDF = Contra Costa County Main Detention Facility  
PIMA = Pima County Jail  
ROA = Roanoke City Jail

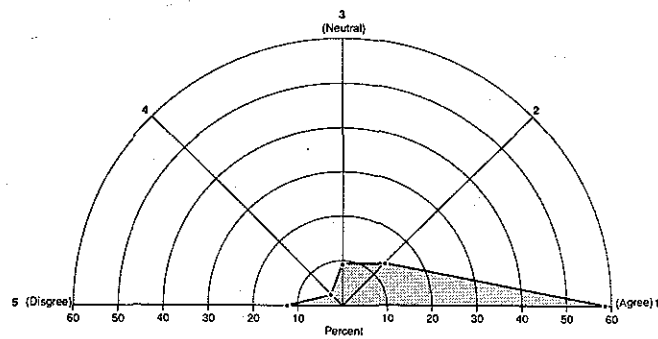
**Fig. 9:** Comparative presentation of evaluation findings concerning inmate safety, in particular inmate attacking inmate, in Contra Costa County Main Detention Facility, Pima County Jail and Roanoke City Jail.

inmate door, 6 wood writing desks, 150 sprinkler heads, 19 sections of various glazing in the visiting rooms and 48 inmate room windows.

CCCMDF inmates were somewhat more concerned about deputies attacking or harming inmates than were inmates at other facilities.

● **Staff-inmate interactions:** Whereas inmates at CCCMDF rated frequency of staff-inmate interaction about the same as inmates at the other facilities, they responded that officers seldom chatted with them or provided counsel. (CCCMDF was rated lowest of all the facilities on these categories). This is likely an effect of overcrowding, and differs from the deputies' perceptions, who rated CCCMDF high on these qualities. As was stated above, the observational data showed that interactions between inmates and staff were brief and businesslike (table 4; figs. 11 and 12).

● **Staffing profiles:** Contra Costa County's detention facilities are under the auspices of the Sheriff's Department and are staffed by deputies. (Deputies are sworn staff). Although the original staffing plan called for one deputy per 45-inmate module, when the module population exceeded 65 in 1985, a second officer was added for the daytime shifts. This sometimes results in two officers supervising as many as 130 inmates. On July 1, 1988 there were 127 deputies and 14 sergeants at the Main Detention Facility for an inmate population of 800. This is an inmate-to-uniformed-staff ratio of 5.7/1. Since opening, the inmate-staff ratio has varied from 4.6/1 to about 6.5/1. A national "rule of thumb" is that good quality facilities should have ratios in the range of 5/1 to 8/1. There were also 60 nonsworn staff, such as clerks, cooks,



Inmate Questionnaire Question 13				
Total $\bar{X}$	CCCMDF	PIMA	ROA	
2.2	1.9	2.1	2.3	

#### Legend

— CCCMDF  
--- PIMA  
... ROA

Compared to other jails, CCCMDF inmates had little concern about sexual assault.

Note: CCCMDF = Contra Costa County Main Detention Facility  
PIMA = Pima County Jail  
ROA = Roanoke City Jail

**Fig. 10:** Comparative presentation of evaluation findings concerning inmate safety, particularly sexual assault, in Contra Costa County Main Detention Facility, Pima County Jail and Roanoke City Jail.

**Table 4**  
**CCCMDF — Interactions between staff and inmates**

Quality of Interaction by Site							
	CCC	CHIL	LCI	PIMA	ROA	Total	Total Number
1 Friendly	4.86%	0.76%	5.41%	5.97%	36.67%	13.24%	147.00
2 Business-Like	14.29	6.82	20.27	29.85	2.67	13.60	151.00
3 Hostile	78.12	90.15	72.97	59.20	61.33	70.90	787.00
4	1.52	2.27	1.35	3.98	0.33	1.71	19.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean, All	2.77	2.94	2.70	2.32	2.25	2.61	
Mean, Staff-Initiated	2.70	2.98	2.69	2.66	2.19	2.52	
Mean, Inmate-Initiated	2.87	2.90	2.70	2.60	2.95	2.79	

Duration of Interaction by Site							
	CCC	CHIL	LCI	PIMA	ROA	Total(%)	Total Number
0-1 Min (%)	85.00	79.00	97.00	90.00	90.00	94.00	743.00
1-2 Min (%)	10.00	11.00	2.50	10.00	5.00	4.00	27.00
2-5 Min (%)	5.00	6.00	0.50	0.00	1.00	1.00	8.00
> 5 Min (%)	0.00	4.00	0.00	0.00	2.00	1.00	8.00

Purpose of Interaction, by Site							
	CCC	CHIL	LCI	PIMA	ROA	Total(%)	Total Number
Staff-Inmate Interaction	63.83%	83.33%	64.86%	76.12%	20.33%	56.76%	630.00
Staff-Staff Interaction	26.14	13.64	30.41	9.95	72.00	34.68	385.00
Staff Phone	6.69	2.27	2.70	13.43	7.67	7.12	79.00
Hostile	0.30	0.76	0.00	0.00	0.00	0.45	5.00
Reprimand	1.82	0.00	2.03	0.50	0.00	0.90	1.00
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	
Total Number	329.00	132.00	149.00	201.00	300.00		1,100.00

Compared to the other jails and prisons studied, interactions between staff and inmates at CCCMDF were brief and business-like.

Note: CCC = Contra Costa County Main Detention Facility  
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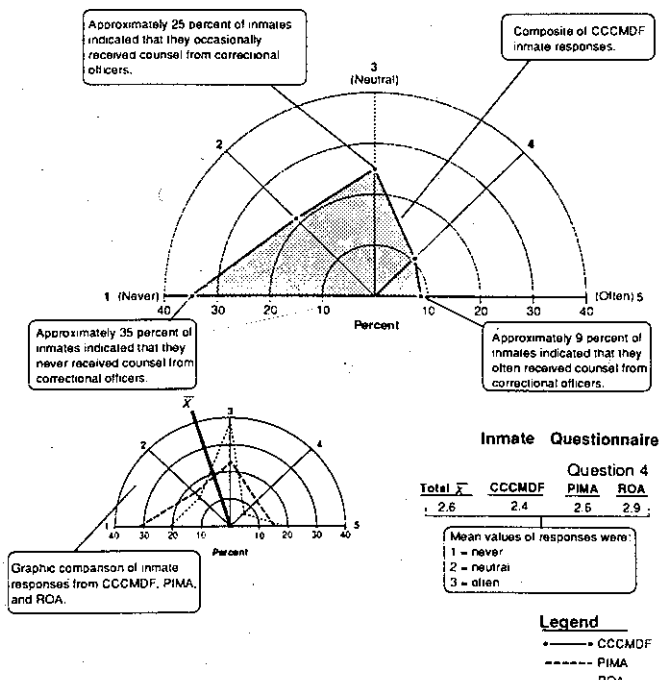
dispatchers, etc.

The deputies working in the modules tend to be fairly young, well educated and inexperienced. Compared to the six jails and prisons studied in the Farbstein/Wener study, CCCMDF deputies were the youngest, had the most education and least time in the facility. Sheriff's Department policy dictates that deputies graduating from the academy work in the jail for 24 months before they can work on patrol and gives them important additional seniority for 6 months additional duty. Also, some senior patrol deputies are voluntarily returning from patrol to serve at CCCMDF. This differs from many counties where jail duty is considered very undesirable.

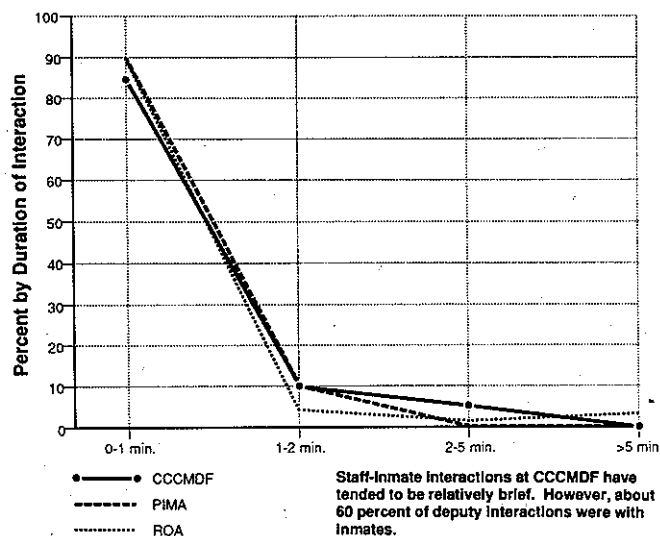
For a jail, the CCCMDF has a high level of staff for education programs, volunteer programs and other activities. The Director of Inmate Services estimated that on any given weekday half of all inmates are engaged in school or some other activity, an extremely high ratio for county facilities.

● **Staff response to CCCMDF:** Deputies find CCCMDF a good place to work, with relatively low stress. Despite overcrowding, CCCMDF received the second lowest stress rating among the seven jails and prisons studied in the Farbstein/Wener study. In the interviews, several deputies commented on the importance of the design and amenities in making it easier to manage inmates: carpeting, adequate phones and television sets and easy access to exercise machines and yards.

The deputies' most persistent concern about the design was about the lack of surveillance from any single point, and particularly from the deputy's station. (This was a deliberate decision modeled after the design of the Federal Metropolitan Correctional Center in Chicago, using the



**Fig. 11:** Comparative presentation of evaluation findings concerning staff-inmate contact in terms of frequency of correctional officers' counsel as described by inmates in Contra Costa County Main Detention Facility, Pima County Jail and Roanoke City Jail.



**Fig. 12:** Comparative presentation of evaluation findings concerning the duration of staff-inmate interaction in Contra Costa County Main Detention Facility, Pima County Jail and Roanoke City Jail.

theory that it would cause the deputies to move around their modules somewhat like a night watchman who is required to punch into various stations; this was a more popular decision when there was less overcrowding and less demands for paperwork.) The deputies had specific concerns that they could not see the shower room and several cells on the upper tier, but the evaluation team was unable to document specific incidents in these areas.

Most deputies also complained about the high noise levels during the late afternoon and evenings, and several deputies proposed creating a physically or acoustically separate TV area. The evaluation team noted that the modules were relatively quiet and seemed calm in the mornings until 60 or 70 inmates were awake and active in the unit.

Deputies also were critical of provisions for staff, and particularly lack of space in which to work and store paperwork and the lack of staff lockers.

• **Staff and inmate safety:** Officers felt reasonably safe and that they could control inmate fights. On most safety questions they rated CCCMDF about the same as deputies or officers rated the other jails which were studied. Compared to the other jails in the Farbstein/Wener study, deputies in CCCMDF stated they break up fights particularly quickly (most in less than one minute), and that threats of violence are relatively infrequent. However, they rated the actual frequency of fights between inmates and officers, and between inmates, as about the same or a bit worse than in the other jails (about halfway between "neutral" and "almost never"). The officers rated their own performance in protecting inmate safety as a little poorer than did other staff in the other jails studied.

The officers felt safer than average, even if no other officers were present. At the CCCMDF, during the seven months between May and November 1988, there were 16 assaults reported against deputies, and 81 against other inmates, but no comparison figures are available. No serious injuries resulted for deputies.

• **Staff-inmate interaction:** Direct supervision relies on frequent interaction and the staff's knowledge of inmates to forestall problems, but there is evidence that overcrowding at CCCMDF is making this more difficult. With 100 to 130 inmates on a unit, one experienced deputy estimated that he knew 80 percent of the inmates by face and 50 percent by name; others gave lower estimates. This is an example where staff-inmate ratios need to be examined carefully: one deputy may get to know 50 or 60 people, but it is hard for two deputies to get to know twice as many. However, the deputies interviewed felt they knew most trouble-makers.

The coded observation data supported other observations by the evaluation team: deputy-inmate interactions were brief — averaging less than one minute — and were businesslike. Both deputies spent most of their time at the deputy's station and about 26 percent of their interactions were with other staff rather than with inmates. Whereas this compared favorably with indirect facilities, officers or deputies in the direct facilities in the Farbstein/Wener study spent more time interacting with inmates. The evaluation team noted some casual chit-chat between deputies, but most conversation seemed business-related, such as arranging work details, court dates, etc. (fig. 12).

Based on their questionnaire responses, the CCCMDF deputies do not entirely agree with the above assessment. Compared to responses by staff in the other facilities studied, the deputies rated CCCMDF highest for the frequency of conversation between inmates and officers, the frequency that officers provide help and counsel and the frequency of casual conversation. This perception may be partly due to the training staff receive in interpersonal communication. (Inmates rate CCCMDF worst or

nearly worst on these categories.)

• **Staff reactions to the physical setting:** In the interviews, staff liked the jail but were concerned with surveillance and noise, and these concerns were also reflected in the questionnaire responses. CCCMDF was also rated low on provisions for staff paperwork. The facility was rated as being sunny and light but as strongly lacking a view to the outside. (The large day room windows provide light and views to the exercise yards, but not to trees or other activity.) Overall, CCCMDF was rated best among the seven facilities as looking good, and the deputies found the colors pleasant. Despite the crowding, the facility was rated among the cleanest of the facilities studied. This fit well with the evaluation team's observations; we found the facility clean and well-kept.

• **Staff reactions to crowding:** Not surprisingly, the deputies rated CCCMDF very crowded on all measures. (During the time the survey was administered, some modules housed nearly three times their designed capacity.)

• **Operating costs:** Despite some fluctuations, real dollar operating costs for CCCMDF have decreased substantially since the facility opened. This is probably due to experience gained in running the facility and economies resulting from overcrowding (support staff positions have not increased at the same rate as the inmate population). The per-inmate operating costs listed in table 5 were supplied by Mr Reed McDonald in the Contra Costa County Sheriff's Department.

Because of different accounting procedures it is difficult to compare CCCMDF's operating costs to other facilities. However, according to a recent report by Ms Carol Kizziah, a consultant to the Contra Costa County Administrator, on a per-inmate basis CCCMDF appears to be more expensive to operate than most jails in California, but compares favorably to national statistics. At least some of the cost is related to Contra Costa's commitment to running an accredited, modern, professional jail with more programs and a higher level of staff than most California jails. Because of the low incarceration rate in Contra Costa County, the per-citizen cost for detention is quite low.

Table 5  
CCCMDF — Operating costs

Year	Cost (w/o med)	Cost with med	1988 Dollars	Avg Census
1981-82		20,139	27,389	392
1982-83		17,816	22,448	477
1983-84		16,677	19,348	499
1984-85	16,151	17,840	20,694	547
1985-86	16,312	18,560	20,230	571
1986-87	16,171	18,397	19,500	641
1987-88	15,158	16,859	17,196	745

1988 National sample: \$28,300 for direct supervision jails, \$42,300 for indirect supervision jails

Constant-dollar costs have declined steadily on a per-inmate basis, reflecting increased experience with the facility and higher censuses.

For comparison, in a 1985 study of 13 California counties by Ms Kizziah, Contra Costa County was the second highest in terms of cost on a per-inmate basis. It was the third lowest on a per-citizen basis, reflecting the low incarceration rate.

CCCMDF's \$16,859 annual per-inmate operating costs compare favorably to national statistics. Based on the Wener and Farbstein national mail survey of jails, the average operating costs for 23 jails was \$28,300 for direct supervision jails and \$42,300 for indirect supervision jails.

• **Maintenance costs:** The original equipment in the jail has fared well, especially considering the strains placed by overcrowding. Few major repairs have been needed. The following have required replacement: a rolling door in the vehicle sallyport, elevator lift motor and motor on washer-extractors. There was also a leak in the lining of the boiler. According to Mr Bill Schmidt, Director of Support Services, with overcrowding there has been little opportunity to do preventive maintenance; he feels pleased if he can take care of daily needs.

The carpeting is cleaned once a week, and Mr Schmidt has found that the cost and maintenance of carpet compares favorably to tile. After eight years of 24-hour-per-day use, the carpeting is showing wear in high traffic areas but has generally held up well. Mr Schmidt said: "Inmates can operate rug shampooers, but you can't teach good floor waxing."

According to a recent report by Nelson,<sup>5</sup> using non-security cell doors and fixtures saves \$2,500 per cell or more. *This reflects a savings of \$970,000 for the facility as a whole, with little breakage or necessary maintenance.*

## Discussion

Direct supervision in general and CCCMDF particularly are attempts to change the fundamental approach and culture of corrections. Rather than focusing on controlling inmates through isolated remote surveillance and the threat of armed intervention, CCCMDF relies on daily contact between deputies and inmates. Deputies and inmates both expect to be in the facility for a relatively short time so there is less incentive for abuse of this relationship than there might be in a longer term facility. The physical facility itself is aimed at providing custody where low levels of tension allow educational and recreational programs to be effective.

These ambitious goals seem mostly to be realized at CCCMDF. Despite very heavy overcrowding, there is relatively little stress and anxiety among inmates and staff. This appears to result from a combination of physical design and operational procedures. The design offers inmates a wide choice of activities they can engage in without staff permission or escort. The relatively pleasant setting reduces irritants and establishes expectations for good behavior.

The direct supervision concept itself appears to be critical for the success of the facility. Having unarmed deputies locked into housing units successfully causes them to deal with day-to-day problems in non-confrontational ways, although the intense overcrowding seems to have somewhat compromised the friendly staff-inmate relations hoped for by the designers. Other key factors in the operations are the efficient classification system for inmates, the presence of many activities and

programs, ongoing staff training, and that staff themselves are highly competent and well educated.

Despite the general success of the facility, some staff felt that the very high crowding levels were potentially explosive. They felt that it was a matter of time until a major incident occurred. (Contra Costa County is building a new facility that will relieve overcrowding at CCCMDF.)

One issue that emerged somewhat unexpectedly was the relationship between the direct supervision model, module layout and staff isolation. Direct supervision represents a fundamental reformulation of the relationships in a correctional facility, and does this in part through spatial means. Instead of grouping officers in a control room that is their territory, and separate from an inmate territory, officers are placed on a housing unit without any special enclosure. Officers are encouraged to take control of the housing unit through social means, by talking to and observing the inmates. At CCCMDF, this was done very explicitly by originally putting only one deputy in each module. In addition, no panopticon-like "sweet-spot" is available that allows the deputy to view the entire unit from a single position, an explicit gesture intended to keep deputies patrolling the unit and to allow some inmate privacy.

These strategies were apparently effective but were not popular among staff. Without exception, the deputies we interviewed wanted another deputy present, no matter how many inmates are housed in the modules, and complained about the lack of a sweet-spot. (These complaints were from staff who were newly out of the Sheriff's academy and did not have experience with more traditional models of detention. Hiring these more flexible deputies has been an explicit strategy at CCCMDF to help initiate their new approach.) Our observations revealed that much of the deputies' interactions in the present modules were with other officers, although most of that was business-related. Deputies spent most of their time at or near the deputy station, but would make periodic tours of the modules.

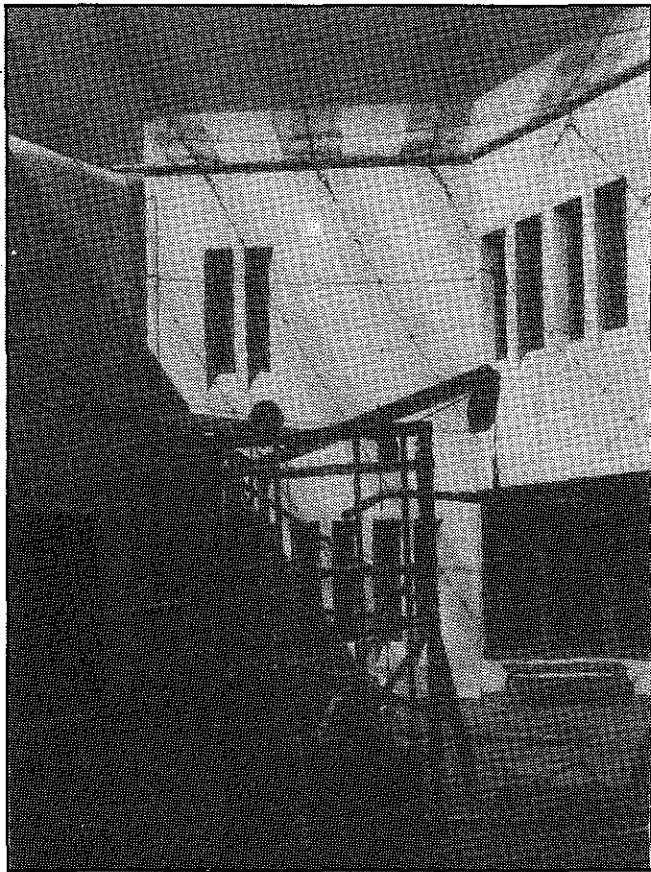
In addition, the decentralization of services and amenities in the modules successfully reduces the size of inmate groups and reduces the need to escort them to activities. However, it reduces variety for inmates and staff. This decentralization means that deputies may have little chance to interact with other deputies and that inmates, and deputies, are confined to a relatively small area for extended periods. Comments suggested that this monotony may be stressful in itself (fig. 13).

These relationships highlight some of the choices and potential tensions in jail and prison design. Assignment of single staff to housing units focuses them toward interacting with inmates but is unpopular and potentially stressful. The lack of central observation points keeps officers moving but is unpopular and seems only modestly successful at CCCMDF, where training is excellent and morale is high. In more dangerous and older Texas prisons, the lack of total surveillance led to abandonment of the secondary prison corridors to inmates. Providing small inmate groups makes management easier but limits variety for inmates and deputies.

## Observations by the evaluation team

One's first impression in visiting CCCMDF is that it is





**Fig. 13:** Contra Costa County Main Detention Facility — View of decentralized exercise yard that inmates could access without special escort.

something other than a jail, perhaps that it is a rehabilitation program. It is not luxurious, but the colors and materials are pleasant and there is a general lack of stress and fear. Observing for a while, one is more likely to see an inmate drinking a cup of coffee and reading a newspaper than hassling someone else. There is a constant flow of volunteer and paid staff through the housing units and the deputies — who are always unarmed — seem alert but not scared. No one would want to stay here if they could be free, especially with the noise and lack of privacy that have come with crowding, but it appears to be a tolerable place to do time.

After visiting CCCMDF several times, observing, talking to many inmates, staff and visitors and analyzing a wide variety of records the conclusion is the same: CCCMDF is a jail that works. Despite increasing stress due to overcrowding, most signs of pathology, such as aggression, sexual assault, suicide and vandalism are rare, and the facility is well maintained.

At CCCMDF, the model of direct supervision developed by the Sheriff's Department, citizens groups and the designers is effective. In fact, CCCMDF has recently been awarded a major grant to teach direct supervision. The design of the physical facility and the operations procedures result in a well-run jail that is, by US national standards, quite inexpensive to run.

It is hard to identify a single "key" to this success. As we have discussed above, the original design and opera-

tional concepts have generally proven to be effective, with a few surprises.

## Lessons learned

This evaluation suggests several lessons:

- Direct supervision works, at least at CCCMDF, to provide a jail that is safe and cost-effective to operate.
- A jail with institutional rather than correctional furnishings can withstand heavy 24-hour use without requirements for unusual maintenance or repair.
- Unarmed deputies can spend the entire day with inmates and feel safe and not particularly stressed, even in a highly overcrowded facility.
- A direct supervision jail can have assault and vandalism rates as low or lower than new well-run indirect facilities.
- Attending to the sources of friction in a jail, and reducing them, can successfully reduce tension and violence. Having an adequate number of televisions, telephones and exercise equipment that did not interfere with each other was a very important contributor to the success of CCCMDF.
- A participatory planning process involving citizens and a wide range of professionals can result in a facility that is well accepted by the community.
- A clear specification of operating procedures early in the planning process, and good understanding of these procedures by the facility designers, can result in a jail that requires little subsequent retrofit.
- Professional assessment of special needs such as mental health is critical to avoid later, expensive, changes or additions.
- Decentralization of housing units and amenities has many advantages in isolating potential trouble and reducing the need to escort inmates, but it may also isolate deputies. Other strategies for providing opportunities for deputies to interact with other deputies perhaps should be explored.
- Well-established plans for maintenance management, capital improvement and preventive maintenance can help in effective use of limited maintenance budgets.
- Providing an efficient, non-intimidating entry process for family, visitors and attorneys reduces stress for both visitors and inmates.
- Providing staff training and using staff open to new ways of operating supports direct supervision.
- Having a classification system that segregates troublesome inmates into a special unit allows other units to operate at a lower level of security.

## Fourth generation jails

CCCMDF is sometimes called a "third generation" jail because it is based on evaluation results from the second generation Federal Metropolitan Correctional Centers. This report suggests some directions for a fourth generation facility:

- Expand inmate programs in jails and provide space and proper conditions for programs to be successful. The original planning process did not allow adequate space for today's expanded programs and the reduced stress levels in a fourth generation jail suggests that programs can succeed.

- Expand the use of institutional rather than correctional materials. Except for detention or isolation areas, it is feasible to use "benign institutional" furnishings in all areas of a well-run direct supervision facility.
- Consider providing "dry cells" that do not have plumbing or toilets; these cells are much less expensive than wet cells. Single-occupancy airline-type toilets could be used in fairly high security situations. Contra Costa County is using dry cells in its new West County Facility.
- Provide comprehensive maintenance planning. As maintenance budgets shrink, a fourth generation facility will have a professionally run well-staffed maintenance department to use dollars cost-effectively.
- Think through every element of the design palette. Use an innovative approach to eliminate such institutional symbols as walls with repetitive doors.
- Use only the security level required (but remember that populations may "harden"). Extra unneeded security provisions waste human and fiscal resources.
- Consider a stronger emphasis on rehabilitation and the inculcation of behavior that is acceptable to society.

## Notes

1. Although we have focused in the past on *psychological* stress (see, for example, Zimring, 1981), in analyzing correctional facilities we have broadened this approach to include physiological and social and organizational processes as well.
2. For further information about this article please contact Craig Zimring, College of Architecture, Georgia Institute of Technology, Atlanta, Georgia, 30332-0155. (Electronic mail: CZIMRING @ GTRIO 1.GATECH.EDU; Telefacsimile (404) 894-3876).

3. Both Cherry Hill and Auburn were based on the presumed reformatory power of solitude, with Cherry Hill providing solitude through architectural separation and Auburn providing it by strict rules. The alternative designs were hotly debated and were influential for subsequent US and European prison design.

Solitude in prisons was seen as important for several reasons:

- it caused inmates to reflect, and therefore to reform themselves;
- because there was no communication, corruption was not spread;
- solitude itself was seen as terrifying for those who were guilty, and hence served as a deterrent (EVANS, 1984).

Remnants of these beliefs may be one reason why inmates at higher security levels in US prisons are more likely to have individual cells, which often seems paradoxical to those who see privacy as desirable.

At Auburn, complete isolation of each inmate was tried for several months but was abandoned after several inmates died or went mad. The revised Auburn system, using officers to enforce silence, called the "silent system," was more attractive to European designers than the Cherry Hill "separate system." The silent system was seen as more humane and

flexible and less expensive.

4. Richard Wener and Richard Olsen, *User Based Assessment of the Federal Metropolitan Correctional Centers: Final Report* (Polytechnic Institute of New York, 1978).
5. W. Raymond Nelson, "Cost savings in new generation jails: The direct supervision approach," *National Institute of Corrections Construction Bulletin* (July 1988).

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